

Chapter 1

Square Roots and Surface Area

Sep 8-9:33 AM

PERFECT SQUARE:
A number that is the square of a number


For example 25 is a perfect square because $5^2 = 25$
[5x5]

Which of the following are perfect squares?

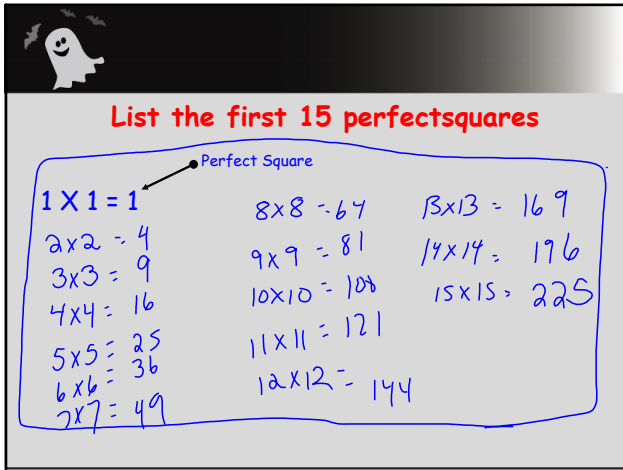
a) 23 b) 36 c) 10 d) 49

NO yes 6x6 NO 7x7

yes



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List the first 15 perfect squares

Perfect Square

$1 \times 1 = 1$	$8 \times 8 = 64$	$13 \times 13 = 169$
$2 \times 2 = 4$	$9 \times 9 = 81$	$14 \times 14 = 196$
$3 \times 3 = 9$	$10 \times 10 = 100$	$15 \times 15 = 225$
$4 \times 4 = 16$	$11 \times 11 = 121$	
$5 \times 5 = 25$	$12 \times 12 = 144$	
$6 \times 6 = 36$		
$7 \times 7 = 49$		

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Draw a SQUARE that represents an area of:

Area of Square = 16 Area of Square = 9


$A = bh$
Area of Square = Side²
 $A = S^2$

Can you draw a square to represent an area of 12?
Why or Why not?

* 12 is not a perfect square
* 12 is between the two perfect squares 9 and 16

* $\sqrt{12} = 3.46410...$

* When using your calculator to determine if a number is a perfect square you take the square root and your answer must terminate! [stop]



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If a square has an area of 100 what is the length of one side [side length]?

Draw a picture

$A = 100$


* Side length of square = $\sqrt{\text{Area}}$

$\sqrt{100} = 10$

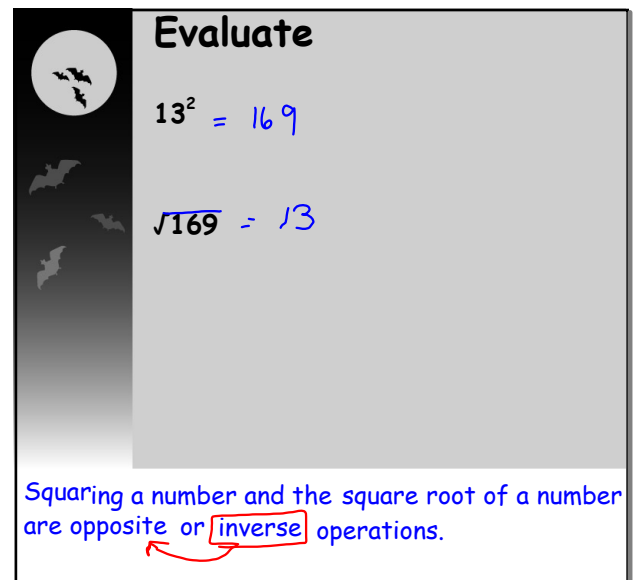
What would the perimeter be?

$P = S_1 + S_2 + S_3 + S_4$
 $10 + 10 + 10 + 10$
40

Square side
 $P = 4S$



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Evaluate

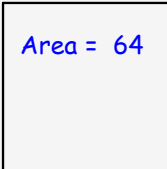
$13^2 = 169$

$\sqrt{169} = 13$

Squaring a number and the square root of a number are opposite or **inverse** operations.

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Find the side length



Area = 64

Side length = $\sqrt{\text{Area}}$
 S.L = $\sqrt{64}$
 S.L = 8

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Complete the table

1. Write the area as a product.
 2. Write the side length as a square root.

Area as a Product	Side Length as a Square Root
$49 = 7 \times 7$	$\sqrt{49} = 7$
$\frac{49}{100} = \frac{7}{10} \times \frac{7}{10}$	$\sqrt{\frac{49}{100}} = \frac{7}{10}$ (circled)
$64 = 8 \times 8$	$\sqrt{64} = 8$
$\frac{64}{100} = \frac{8}{10} \times \frac{8}{10}$	$\sqrt{\frac{64}{100}} = \frac{8}{10}$
$121 = 11 \times 11$	$\sqrt{121} = 11$
$\frac{121}{100} = \frac{11}{10} \times \frac{11}{10}$	$\sqrt{\frac{121}{100}} = \frac{11}{10}$

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How can you use the square roots of whole numbers to determine the square roots of fractions?

Look at the numerator and denominator separately and determine the square root of each.

[Lowest Terms]
 * Fraction must always be in **SIMPLEST FORM** to determine if it is a perfect square!!! *

Is this a perfect square?

$\frac{50}{98} \stackrel{!}{=} \frac{25}{49} = \frac{5 \times 5}{7 \times 7}$ (circled) **Yes**

- As the question is written the answer is NO, this is not a perfect square.
- If not in lowest terms you must reduce the fraction to determine if it is a perfect square.
- Both the numerator and denominator must be perfect squares to say the fraction is a perfect square.

Oct 27-11:36 AM

Are these perfect squares?

A. $\frac{225}{100}$ ← 15×15 (circled) **Yes**
 ↑ 10×10

B. $\frac{196}{81}$ ← 14×14 (circled) **Yes**
 ↑ 9×9

C. $\frac{128}{800}$ (circled) **Yes**
 $\frac{64}{400} = \frac{8 \times 8}{20 \times 20}$
 $\frac{16}{100} = \frac{4 \times 4}{10 \times 10}$
 $\frac{4}{25} = \frac{2 \times 2}{5 \times 5}$

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Which numbers below are perfect squares.

i) 25 ← 5×5 (circled) **yes**

ii) 24 **NO**

iii) 20 **NO**

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